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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,076	07/31/2003	Serge Lasserre	TI-35424 (1962-05403)	2218
23494	7590	07/12/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			GU, SHAWN X	
P O BOX 655474, M/S 3999				
DALLAS, TX 75265			ART UNIT	PAPER NUMBER
			2189	

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,076	LASSERRE ET AL.	
	Examiner	Art Unit	
	Shawn Gu	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 6, 10, 11, 13, 14, 19, 20 and 22-27 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 7-9, 12, 15-18 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This final Office action is in response to the amendment filed on 2 May 2006. Claims 1-27 are pending. Claim 28 has been withdrawn from consideration. All objections and rejections not repeated below are withdrawn.

Election/Restrictions

2. Newly submitted claim 28 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 1-27 are directed to a caching system and a method to determine when to cache certain data from an external memory, classified in class 711/118. The newly submitted claim 28 is directed to a backup and restore method related to a context switch, classified in class 711, subclasses 161 and 162.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 28 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 19, 22-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Per claim 19, the applicant describes “setting a value indicative of which variables are used by finished methods and which variables are used by unfinished methods”, while the specification only discloses that such a value is set for local variables. The Examiner is rejecting the claim in light of the specification.

Per claims 22-24, the specification does not support “only local variables associated with the second group are fetched from memory ... “. Instead, the claims and the specification both support fetching not only local variables from memory. Claim 1 teaches the data memory holds “two groups of local variables ... “. It is clear that these two groups of local variables must have been fetched in the first place in order to

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be in the data memory. Claims 22-24 are inconsistent with the specification and claims 1, 10 and 19.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 5, 6, 10, 11, 13, 14, 19, 20 and 25-27 are rejected under 35 U.S.C. 102(b) as being unpatentable over Tremblay et al. [6,067,602] (hereinafter “Tremblay”).

Per claims 1, 10 and 19, Tremblay discloses:

A processor (Fig 3B, Stack-Based Computing System 300) adapted to couple to external memory (Fig 7, Main Memory 750), comprising:

a processing core on which a plurality of methods execute (Figs 4A, 4B, 4C, 4D; Col 4, Lines 27-53); and

a cache subsystem (Fig 3B, the combination of 310, 320, 330, and 340) accessible to the processing core and comprising a data memory (Fig 3B, combination of Stack 310 and Stack 320) coupled to a cache controller (a cache controller must exist to operate the Stack Cache Management Units 330 and 340), the data memory holds a contiguous block of memory (Figs 4A-4D; stacks are contiguous blocks of memory)

defined by an address stored in a register accessible to the cache controller (a stack is addressed by a stack pointer address held in a stack pointer register);

wherein the data memory is adapted to store a first group of local variables associated with finished methods (Fig 4D; Stack 310 stores local variables of methods B and D, which can be finished at a point in time when methods A and C are still executing, according to the principle described in Col 7, Lines 38-43) and a second group of local variables associated with unfinished methods (Fig 4D; Stack 320 stores local variables of methods A and C); and

wherein, based on a threshold value (Fig 4D; Areas A, B, C, and D are separate memory regions, and therefore when local variables associated with a method are fetched from or saved to the external memory, an address is used as the threshold value; or the method frames and the method ID must be serve a threshold to distinguish the methods A-D from one another), local variables associated with the second group (During the time interval when B and D are finished while A and C are unfinished, the operand and execution environment data of Method B is popped from Stack 320. This requires first removing the Local Variables belonging to Method C. According to Tremblay, the Local Variables of Method C would then be reloaded to Stack 320 since Method C is still unfinished, see Col. 7, Ln.38-43) are fetched from memory that is external to the cache subsystem (Col. 7, Ln.10-43).

It is clear that the method of claim 19 is performed by the system of claim 1 and the processor of claim 10. It is also clear that the threshold value set forth above

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anticipates the limitation "setting a value indicative of which variables are used by finished methods ... unfinished methods".

Per claims 2 and 11, Tremblay furthers discloses that the threshold value comprises an address that points to a line in the data memory that separates the first and second groups (Fig 4D; Areas A, B, C, and D are separate memory regions, and therefore when local variables associated with a method are fetched from or saved to the external memory, an address is used as the threshold value).

Per claims 5 and 13, Tremblay furthers discloses that methods are invoked and each time a method is invoked, the threshold address is adjusted (Col 7, Lines 10-38).

Per claims 6 and 14, Tremblay furthers discloses that the threshold address also is adjusted when a method finishes (Col 7, Lines 38-43).

Per claim 20, in the above claims Tremblay already discloses that setting the value includes determining the address that separates the storage regions of the first and second groups of local variables, and the groups of local variables are stored in stacks, which are addressed by a stack pointer address held in a stack pointer register in a computing system. Therefore, it is clear in Tremblay's invention that setting the value includes adjusting a pointer address.

Per claims 22-24, Tremblay further teaches only local variables associated with the second group are fetched from memory that is external to the cache subsystem (the only data reloaded from main memory belongs to Method A, which is unfinished; see, Col.7, Ln.38-43).

Per claims 25-27, it is clear the claims are already substantially disclosed as set forth in claims 1, 10 and 19. Tremblay also teaches the limitation "or saved to the external memory" (data of Method A is both fetched from and saved to the external memory, see Col.7, Ln.10-43).

Allowable Subject Matter

7. Claims 3, 4, 7-9, 12, 15-18 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 2, 5, 6, 10, 11, 13, 14, 19, 20 and 22-27 have been considered but they are not persuasive. The amended claims are taught by Tremblay [6,067,602] as set forth above.

In response to the Applicant's argument regarding the rejection of claim 19 under 35 U.S.C. 112, paragraph one (see Remarks, Pg.11, 3rd and 4th paragraphs), the specification clearly states that the value is only set for local variables (see pg.12, para.[0033]). A local variable is a variable, but a variable is not necessarily a local variable. The specification does not support assigning a value to indicate usage by a finished method or unfinished method to a variable that does not qualify as a local variable.

In response to the Applicant's argument regarding the independent claims 1, 10 and 19 (see Remarks, Pg.14, 3rd and 4th paragraphs), the Applicant argues that all of Tremblay's methods A-D are called sequentially and A invokes B, B invokes C and C invokes D. The Examiner finds no support in the reference for the above. Instead, Tremblay only discloses "if C invokes D" (see Col.2, Ln. 8-10) and "if A invokes B" (see Col.4, Ln.45-48). However, Method C is not invoked by Method B. Hence, the Examiner believes that the Applicant's conclusion about Tremblay's methods being either all unfinished or all finished at the same time to be incorrect. In the dual stack system embodiment (see Fig. 3B and 4D) of Tremblay's invention, if Methods D and B finishes, their local variables stored in Stack 310 (see Fig. 4D) can be accessed without popping out the local variables of the invoking methods C and A (see Col.4, Ln. 54-67) stored in Stack 320 (see Fig. 4D). Since Methods D and B are invoked by Methods C and A respectively, then C and A cannot finish until D and B are finished. During the period between Methods D and B are finished while Methods C and A are unfinished,

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Stack 310 becomes the first group comprising local variables associated with finished methods, and Stack 320 becomes the second group comprising local variables associated with unfinished methods. During the same time interval, the operand and execution environment data of Method B is popped from Stack 320. This requires first removing the Local Variables belonging to Method C. According to Tremblay, the Local Variables of Method C would then be reloaded to Stack 320 since Method C is still unfinished (see Col.7, Ln. 38-43).

9. No new ground(s) of rejection is introduced in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

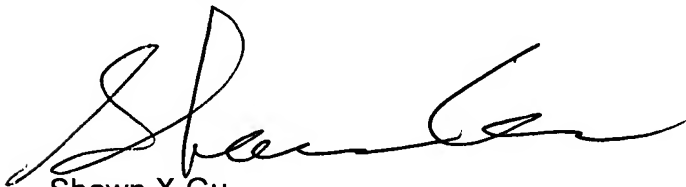
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703.

The examiner can normally be reached on 9am-5pm, Monday through Friday.

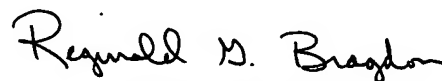
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shawn X Gu
Patent Examiner
Art Unit 2189

27 June 2006



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